I-495 HOT LANES PROJECT

VIRGINIA CONCRETE CONFERENCE
"CONCRETE: LEADING THE WAY"

Dan Staron, P.E. HNTB Corporation

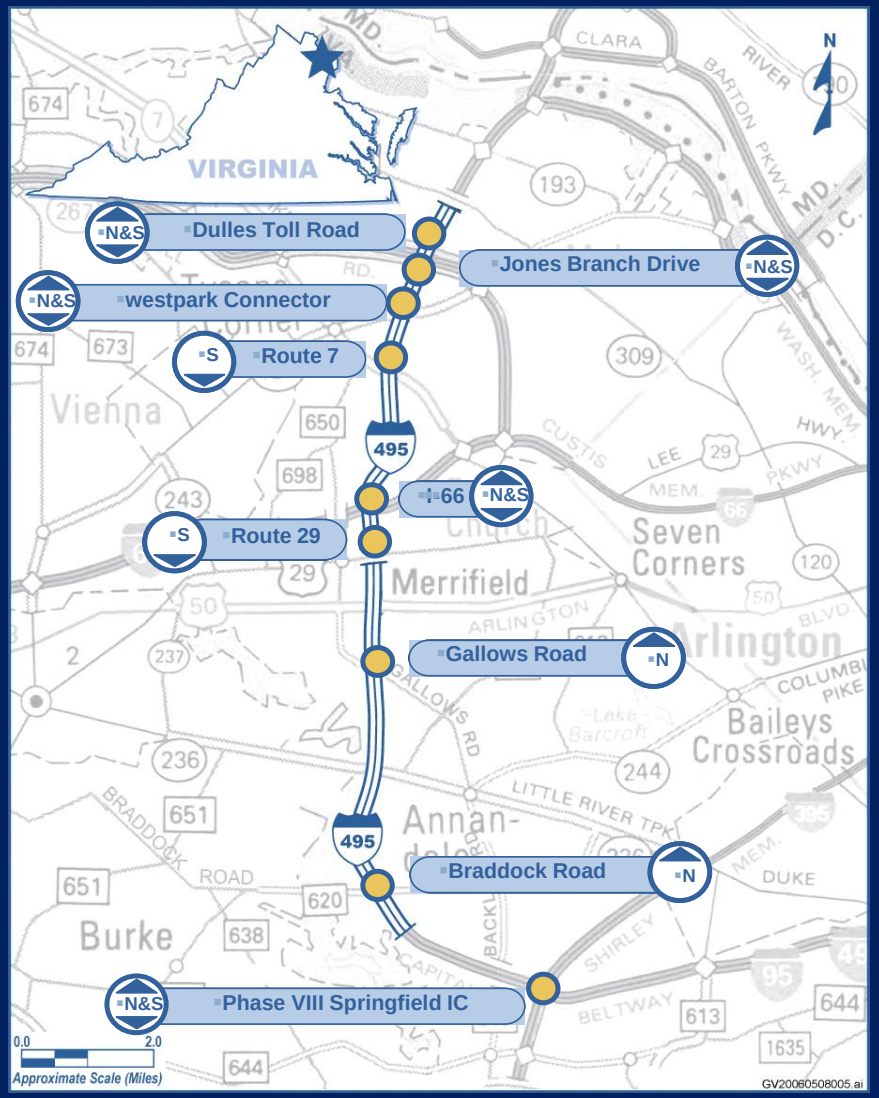
HNTB transurban FLUOR-LANE VDOT

I-495 HOT LANES PROJECT

PRESENTATION OVERVIEW

- Project Background/Highlights
- Design Challenges
- Technical Details
- Concrete Applications/Details

I-495 HOT LANES PROJECT



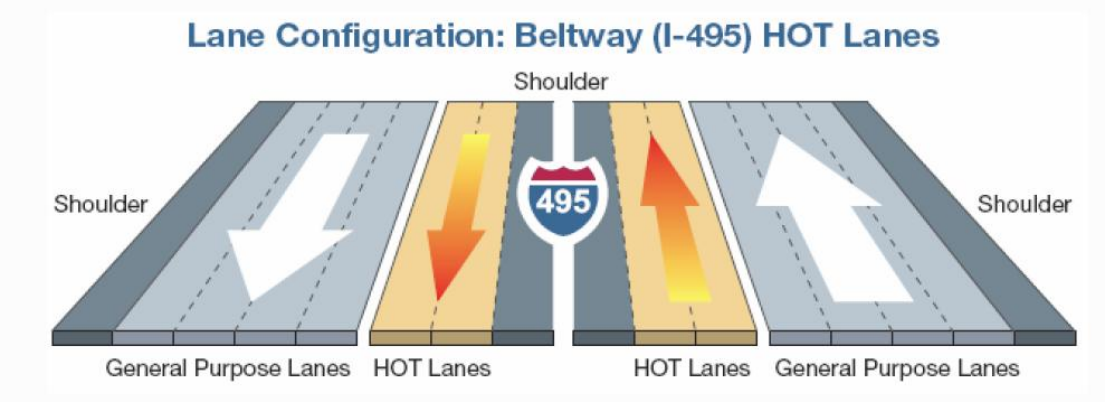
14.5 MILE SEGMENT OF THE CAPITAL BELTWAY

HNTB transurban FLUOR-LANE VDOT

I-495 HOT LANES PROJECT

VDOT's FIRST MAJOR HOT LANES P3 PROJECT

- Connects I-66, I-95 and the Dulles Toll Road
- 75-year operation agreement with private concessionaire
- Addition of two new HOT lanes in each direction for 14.5 miles
- Buses and HOV-3 travel toll-free
- Tolls for HOT lanes vary based on congestion/demand



I-495 HOT LANES PROJECT

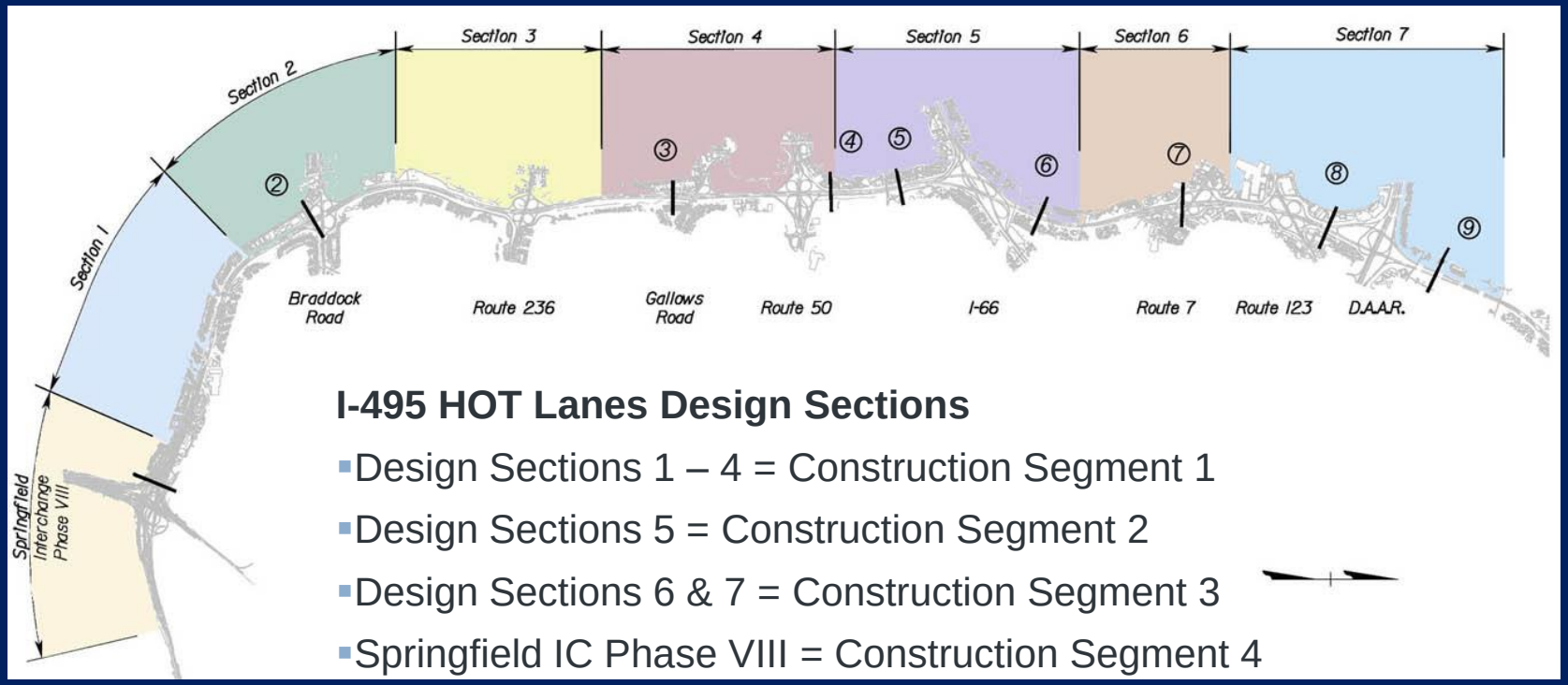
PROJECT SUMMARY

- 57 bridges - majority new or replacement structures
- Expanded Bike/Pedestrian accommodations on arterial crossings

- Reconstruction of 12 interchanges
- 70,000 LF (14 miles) of soundwalls constructed along the corridor
- Electronic open road tolling w/o toll booths

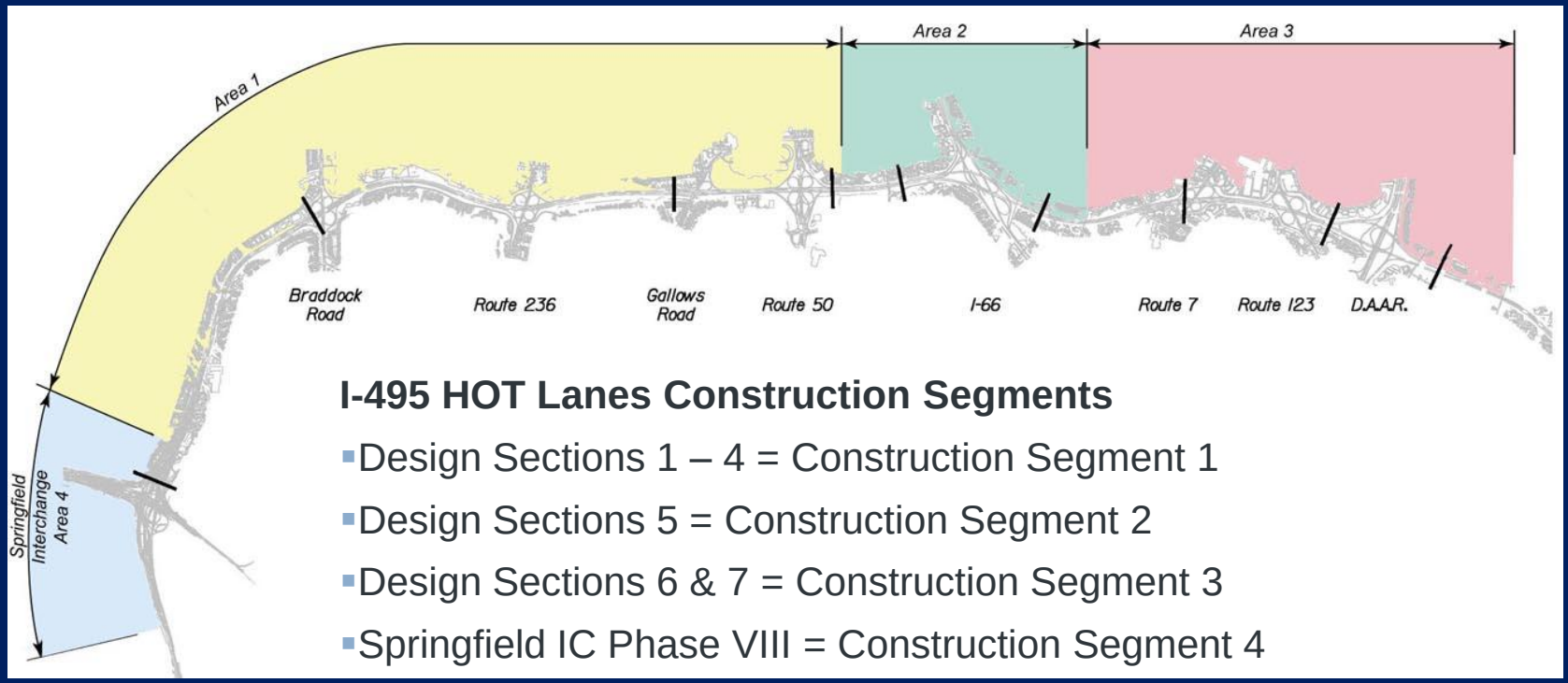
I-495 HOT LANES PROJECT

PROJECT SUMMARY – Design Sections



I-495 HOT LANES PROJECT

PROJECT SUMMARY – Construction Areas



I-495 HOT Lanes Construction Segments

- Design Sections 1 – 4 = Construction Segment 1
- Design Sections 5 = Construction Segment 2
- Design Sections 6 & 7 = Construction Segment 3
- Springfield IC Phase VIII = Construction Segment 4

I-495 HOT LANES PROJECT

VDOT

Amended and Restated Comprehensive Agreement

Concessionaire (CBE)

FLUOR® transurban

D/B Contract

Design-Build Contractor

FLUOR® THE LANE CONSTRUCTION CORPORATION OVER 100 YEARS A Commitment to Excellence

Consultants/Subcontractors

HNTB Wetland Studies and Solutions, Inc. JACOBS G&O GREENHORNE & O'MARA CONSULTING ENGINEERS transurban

Operations & Maintenance

transurban

Subcontractors

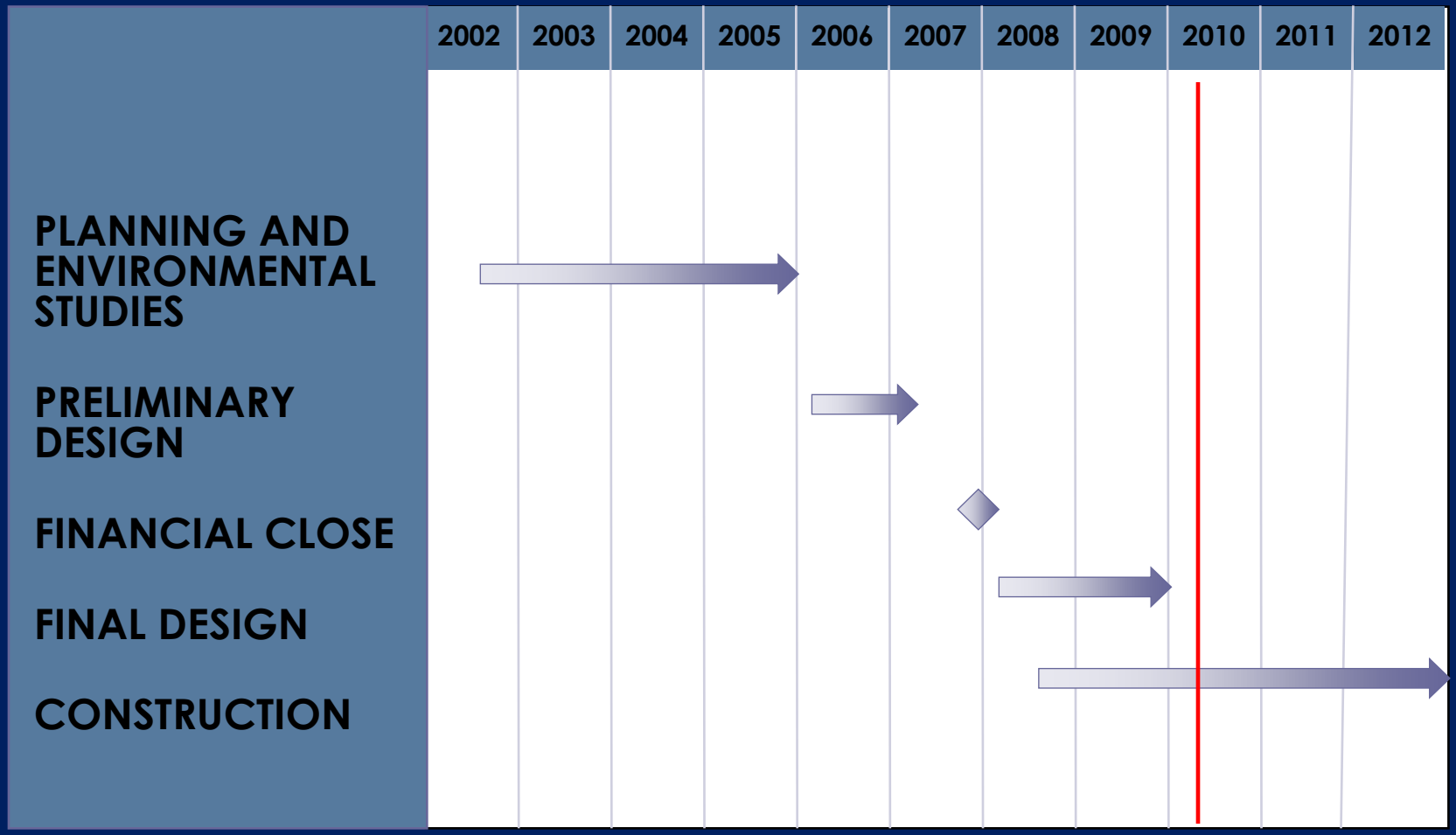
VMS INC.

- TMS Integrator – TBD
- ETC System Integrator - TBD

O/M Contract

I-495 HOT LANES PROJECT

PROJECT TIMELINE



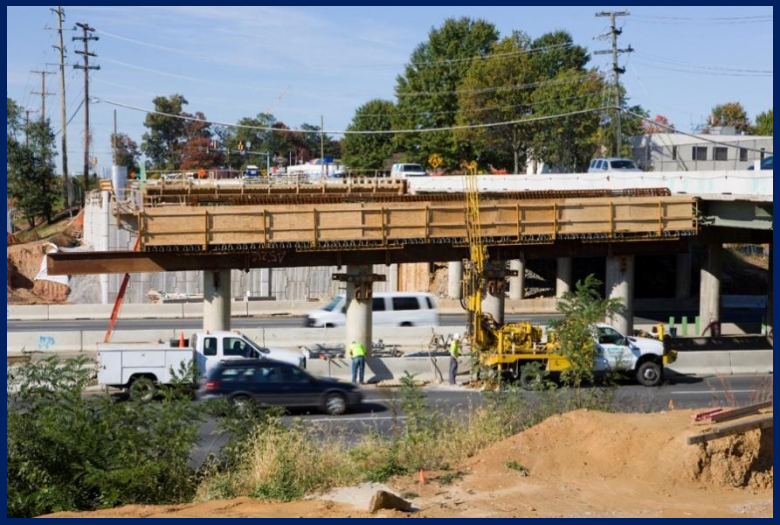
I-495 HOT LANES PROJECT

FUNDING OF TOTAL PROJECT COST WITH FINANCING OF $1.9B ($1.4B CONSTRUCTION)

- $409M – Commonwealth of Virginia
- $349M – Private Equity
- $586M – Private Activity Bonds
- $585M – FHWA TIFIA Loan

I-495 HOT LANES PROJECT

DESIGN CHALLENGES

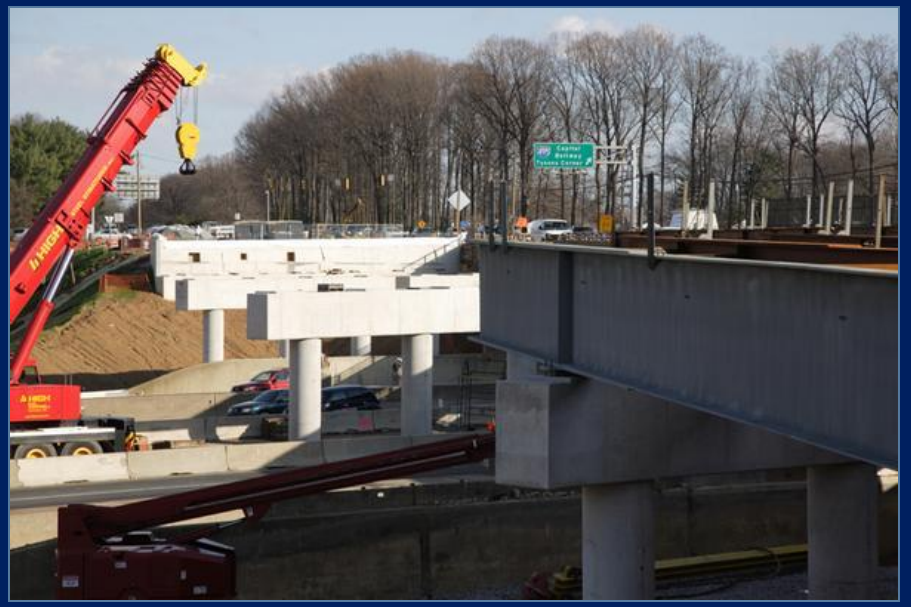


- Compressed design schedule (16 months +/-)
- Tight urban confines\MOT
- Geotechnical explorations\design
- 200 +/- Approved For Construction (AFC) Packages
- All 8 sections of the project (4 construction areas) designed and being constructed concurrently
- Coordination with Dulles Metrorail Phase I crossing in Tyson's Corner

I-495 HOT LANES PROJECT

TECHNICAL DETAILS

- Load Factor Design (LFD) employed for structural design
- Both concrete and steel superstructures utilized
- VDOT integral abutment details employed to the extent possible
- Pier cap geometrics and column/cap sizes standardized for construction efficiency
- Low permeability concrete Used throughout the project



I-495 HOT LANES PROJECT

CONCRETE APPLICATIONS – DRILLED SHAFTS

- Bridge piers primarily founded on drilled shafts socketed into competent rock or terminating in highly-weathered rock
- Typical drilled shafts sizes range from 48” to 60”. Selected locations have larger (up to 96”) shafts
- Both temporarily cased and slurry shafts employed
- 3000 to 5000 psi mixes typically utilized; 2500 coulombs max.; # 8 aggregate used
- Approximately ***13,000 LF; 8,600 cubic yards*** of concrete required project-wide for drilled shafts

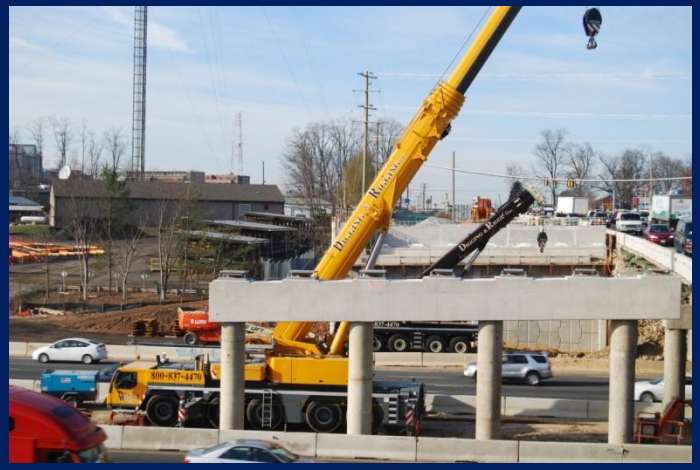
I-495 HOT LANES PROJECT

CONCRETE APPLICATIONS – DRILLED SHAFTS

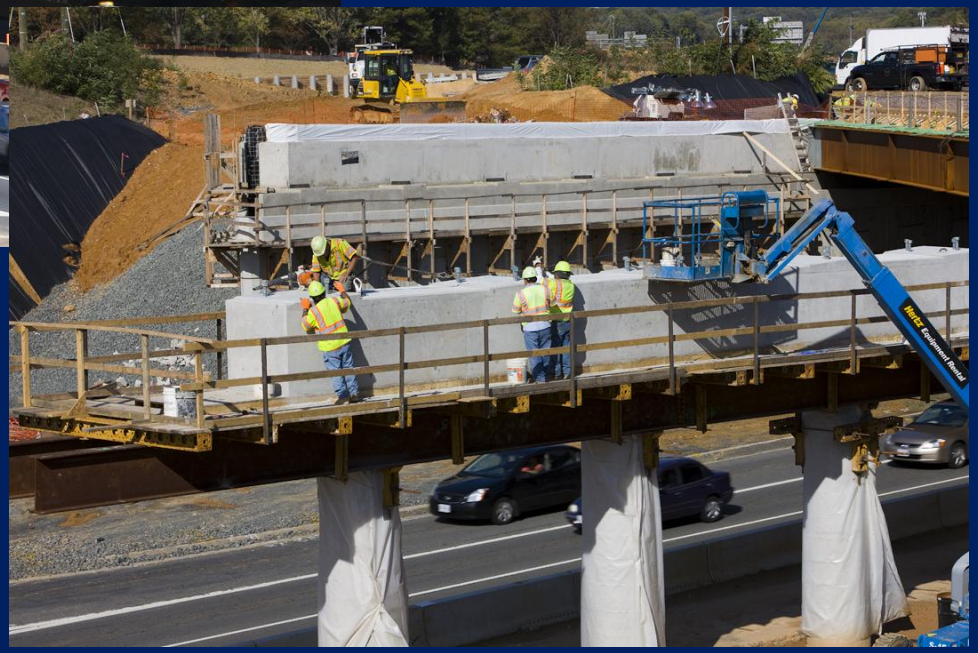
I-495 HOT LANES PROJECT

CONCRETE APPLICATIONS – SUBSTRUCTURES

- Maintain Springfield Interchange aesthetic – Section 8 (Phase VIII)
- Common details/shapes/sizes for Sections 1-7
- ***30,000 Cubic Yards*** of concrete required



I-495 HOT LANES PROJECT

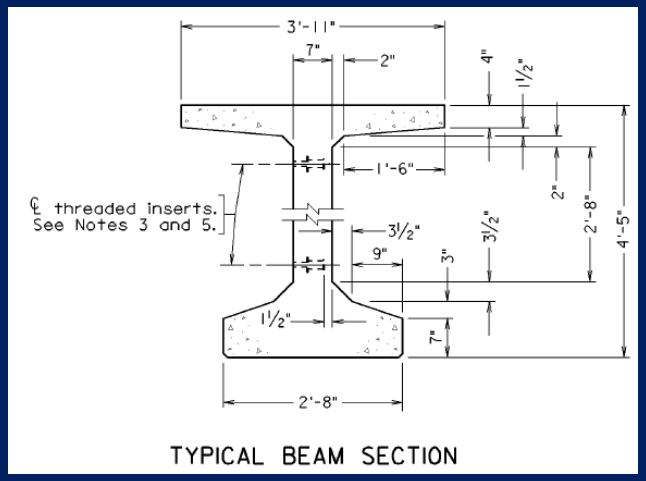


HNTB transurban FLUOR-LANE VDOT

I-495 HOT LANES PROJECT

CONCRETE APPLICATIONS – SUPERSTRUCTURES

- VDOT PCBT's utilized where span configurations and site constraints allowed
- Typically employing 45", 53" or 61" deep PCBT's
- Typical concrete strengths between 5000 psi and 8000 psi - Release strengths typically at 0.8f'c



TYPICAL BEAM SECTION

I-495 HOT LANES PROJECT

CONCRETE APPLICATIONS – BRIDGE DECKS

- Conventional slab on girder or slab on PSBT construction
- A4 or Class 30 low permeability mixes utilized
- ***36,000 Cubic Yards*** of concrete for bridge decks required for the project

HNTB transurban FLUOR-LANE VDOT

I-495 HOT LANES PROJECT

CONCRETE APPLICATIONS – RETAINING WALLS

- MSE and Post/Panel walls employed
- ***900,000 Square Feet*** of retaining structure required for the project

I-495 HOT LANES PROJECT

CONCRETE APPLICATIONS – SOUND WALLS

- Ground-mounted walls – concrete panels/concrete posts
- ***70,000 LF; 1,200,000 SF*** of soundwall required for the project

I-495 HOT LANES PROJECT

IN CLOSING:

- I-495 HOT Lanes will bring sorely needed additional capacity to Northern Virginia's congested "Main Street"
- Current estimated monthly construction activity in 2010 is on the order of $30M per month
- Project is on-schedule and looking forward to a very productive 2010 -- the new General Purpose lanes (4 SB /4 NB) from Gallows Road south to be in service by year-end

I-495 HOT LANES PROJECT

THANKS !

Dan Staron, HNTB Corporation
(dstaron@hntb.com)

Additional Information:

- www.virginiahotlanes.com
- www.vamegaprojects.com

HNTB transurban FLUOR-LANE VDOT